

## CLAIMS

### What is claimed is:

1. A method for screening for the activity of one or more agents on a nematode, said method comprising:
  - 5 providing a microtiter plate comprising a plurality of wells, each of a plurality of said wells containing one or more nematodes;
  - contacting said nematodes with one or more test agents;
  - contacting said nematodes with a detectable label that indicates the viability of said nematodes; and
  - 10 detecting said detectable label to ascertain the viability of nematodes contacted with said one or more test agents where an increase or decrease in the viability of the nematodes contacted with said test agents that the nematodes are susceptible to the activity of said test agent or that said test agent is active on said nematodes.
2. The method of claim 1, wherein said microtiter plate comprises at  
15 least 384 wells.
3. The method of claim 1, wherein said detectable label is a fluorescent label.
4. The method of claim 3, wherein said detectable label is a label that penetrates compromised cell membranes, but is substantially or completely excluded from  
20 live eukaryotic cells.
5. The method of claim 1, wherein said detectable label is selected from the group consisting of SYTOX® blue, SYTOX® orange, and propidium iodide.
6. The method of claim 4, wherein said label is SYTOX® cell stain.
7. The method of claim 3, wherein said detecting comprises detecting  
25 fluorescence in one or more wells comprising said microtiter plate with a fluorometer.

8. The method of claim 1, wherein said providing comprises dispensing one or more nematodes into a plurality of wells comprising a microtiter plate using an automated dispensing system.

9. The method of claim 8, wherein said providing comprises dispensing one or more nematodes into a plurality of wells comprising a microtiter plate using a COPAS™ BIOSORT device.

10. The method of claim 1, wherein said nematodes comprise *Caenorhabditis sp.*

11. The method of claim 1, wherein said nematodes comprise *Caenorhabditis elegans*.

12. The method of claim 11, wherein said nematodes comprise non-wildtype strains of *C. elegans*.

13. The method of claim 11, wherein said nematodes comprise genetic knock outs.

14. The method of claim 11, wherein said nematodes comprise transgenic nematodes.

15. The method of claim 11, wherein said nematodes comprise thermotolerant nematodes.

16. The method of claim 1, comprising subjecting said nematodes to heat and determining if said test agents increase or decrease thermotolerance of said nematodes.

17. The method of claim 1, comprising subjecting said nematodes to an agent that increases oxidative stress and determining if said test agents increase or decrease tolerance of oxidative stress by said nematodes.

18. The method of claim 1, comprising subjecting said nematodes to a nematocide and determining if said test agents increase or decrease tolerance of said nematocide by said nematodes.

19. The method of claim 1, wherein said method comprises providing a multiplicity of said microtiter plates.

20. The method of claim 1, wherein said detecting comprises reading a multiplicity of said microtiter plates.

5 21. The method of claim 1, wherein said microtiter plate is selected from the group consisting of a 96 well plate, a 100 well plate, a 320 well plate, a 384 well plate a 864 well plate, and a 1536 well plate.

22. The method of claim 21, wherein said microtiter plate is opaque.

10 23. A device for screening for the activity of one or more agents on a nematode, said device comprising:  
a microtiter plate comprising a plurality of wells, each of a plurality of said wells containing one or more nematodes.

15 24. The device of claim 23, wherein the wells containing said one or more nematodes also contain a detectable label that indicates the viability of said nematodes.

25. The device of claim 24, wherein said detectable label is a fluorescent label.

20 26. The device of claim 25, wherein said detectable label is a label that penetrates compromised cell membranes, but is substantially or completely excluded from live eukaryotic cells.

27. The device of claim 24, wherein said detectable label is selected from the group consisting of SYTOX® blue, SYTOX® orange, and propidium iodide.

28. The device of claim 24, wherein said label is a SYTOX® cell stain.

25 29. The device of claim 23, wherein the wells containing said one or more nematodes also contain culture medium for said nematodes.

30. The device of claim 23, wherein said microtiter plate is selected from the group consisting of a 96 well plate, a 100 well plate, a 320 well plate, a 384 well plate, a 864 well plate, and a 1536 well plate.

31. The device of claim 23, wherein said microtiter plate is opaque.

5 32. The device of claim 23, wherein at least 96 wells comprising said microtiter plate contain one or more nematodes.

33. The device of claim 23, wherein at least 384 wells comprising said microtiter plate contain one or more nematodes.

10 34. The device of claim 23, wherein at least 320 wells comprising said microtiter plate contain one or more nematodes.

35. The device of claim 23, wherein said microtiter plate is loaded with nematodes using an automated dispensing system.

36. The device of claim 35, wherein said automated dispensing system comprises a COPAS™ BIOSORT device.

15 37. The device of claim 23, wherein said nematodes comprise *Caenorhabditis sp.*

38. The device of claim 23, wherein said nematodes comprise *Caenorhabditis elegans*.

20 39. The device of claim 38, wherein said nematodes comprise non-wildtype strains of *C. elegans*.

40. The device of claim 38, wherein said nematodes comprise genetic knock outs.

41. The device of claim 38, wherein said nematodes comprise transgenic nematodes.

42. The device of claim 23, wherein said nematodes comprise thermotolerant nematodes.

43. A kit for screening for the activity of one or more agents on a nematode, said kit comprising:

- 5                   a microtiter plate comprising a plurality of wells;  
                  a plurality of nematodes; and  
                  a detectable label that indicates the viability of said nematodes.

44. The kit of claim 43, wherein said plurality of nematodes are disposed such that each of a plurality of said wells contains one or more of said nematodes.

10               45. The kit of claim 43, wherein each of a plurality of said wells contains said detectable label.

46. The kit of claim 45, wherein a plurality of the wells containing nematodes also contain said detectable label.

15               47. The kit of claim 43, wherein said detectable label is a fluorescent label.

48. The kit of claim 43, wherein said detectable label is a label that penetrates compromised cell membranes, but is substantially or completely excluded from live eukaryotic cells.

20               49. The kit of claim 43, wherein said detectable label is selected from the group consisting of SYTOX® blue, SYTOX® orange, and propidium iodide.

50. The kit of claim 43, wherein said label is a SYTOX® cell stain.

51. The kit of claim 43, wherein the wells containing said one or more nematodes also contain culture medium for said nematodes.

25               52. The kit of claim 43, wherein said microtiter plate is selected from the group consisting of a 96 well plate, a 100 well plate, a 320 well plate, a 384 well plate, a 864 well plate, and a 1536 well plate.

53. The kit of claim 43, wherein said microtiter plate is opaque.

54. The kit of claim 44, wherein at least 96 wells comprising said microtiter plate contain one or more nematodes.

55. The kit of claim 44, wherein at least 384 wells comprising said microtiter plate contain one or more nematodes.

56. The kit of claim 44, wherein at least 320 wells comprising said microtiter plate contain one or more nematodes.

57. The kit of claim 44, wherein said microtiter plate is loaded with nematodes using an automated dispensing system.

58. The kit of claim 57, wherein said automated dispensing system comprises a COPAS™ BIOSORT device.

59. The kit of claim 43, wherein said nematodes comprise *Caenorhabditis sp.*

60. The kit of claim 43, wherein said nematodes comprise *Caenorhabditis elegans*.

61. The kit of claim 60, wherein said nematodes comprise non-wildtype strains of *C. elegans*.

62. The kit of claim 60, wherein said nematodes comprise genetic knock outs.

63. The kit of claim 60, wherein said nematodes comprise transgenic nematodes.

64. The kit of claim 43, wherein said nematodes comprise thermotolerant nematodes.

65. The kit of claim 43, further comprising instructional materials teaching the use of said kit for high throughput screening for the effect of a test agent on a nematode.